

WHAT IS CLAIMED IS:

1                   1.     A method for generating electrical power from low frequency,  
2     vibrational energy, the method comprising:  
3                   receiving vibrational energy having a low frequency;  
4                   converting the low frequency, vibrational energy to vibrational  
5     energy having a high frequency greater than the low frequency; and  
6                   converting the high frequency, vibrational energy to electrical power.

1                   2.     The method as claimed in claim 1, wherein the step of  
2     converting the high frequency, vibrational energy is performed piezoelectrically or  
3     electrostatically or electromagnetically.

1                   3.     The method as claimed in claim 1, wherein the low frequency  
2     is in the range of 1 to 100 Hz.

1                   4.     The method as claimed in claim 3, wherein the low frequency  
2     is in the range of 1 to 10 Hz.

1                   5.     The method as claimed in claim 1, wherein the step of  
2     converting the low frequency, vibrational energy is performed mechanically.

1                   6.     The method as claimed in claim 1, wherein the step of  
2     receiving the low frequency, vibrational energy includes the step of providing a  
3     micromechanical first resonator device, the first resonator device resonating in  
4     response to the received vibrational energy.

1                   7.     The method as claimed in claim 6, wherein the first resonator  
2     device has a mechanical resonance frequency in the range of 1 to 100 Hz.

1                   8.     The method as claimed in claim 6, wherein the step of  
2     converting the low frequency, vibrational energy includes the step of providing a

3 micromechanical second resonator device, the second resonator device resonating  
4 at the high frequency in response to the resonating first resonator device.

1 9. The method as claimed in claim 7, wherein the second  
2 resonator device has a mechanical resonance frequency in the range of 1 to 10 kHz.

1 10. The method as claimed in claim 8, wherein the second  
2 resonator device includes an array of micromechanical resonators.

1 11. A micro power generator for generating electrical power from  
2 low frequency, vibrational energy, the generator comprising:  
3 means for receiving vibrational energy having a low frequency;  
4 means for converting the low frequency, vibrational energy to  
5 vibrational energy having a high frequency greater than the low frequency; and  
6 means for converting the high frequency, vibrational energy to  
7 electrical power.

1 12. A micro power generator for generating electrical power from  
2 low frequency, vibrational energy, the generator comprising:  
3 a micromechanical first resonator device which resonates in response  
4 to the vibrational energy;  
5 a micromechanical second resonator device; and  
6 a circuit coupled to the resonator devices for coupling the resonator  
7 devices together so that the second resonator device resonates at a high frequency  
8 greater than the low frequency when the first resonator device resonates, the circuit  
9 also converting the high frequency, vibrational energy to electrical power.

1 13. The generator as claimed in claim 12, wherein the high  
2 frequency, vibrational energy is converted electromagnetically.

1 14. The generator as claimed in claim 12, wherein the low  
2 frequency is in the range of 1 to 100 Hz.

1                   15.    The generator as claimed in claim 14, wherein the low  
2   frequency is in the range of 1 to 10 Hz.

1                   16.    The generator as claimed in claim 12, wherein the conversion  
2   of the low frequency, vibrational energy is performed mechanically.

1                   17.    The generator as claimed in claim 12, wherein the circuit  
2   includes a magnet and at least one coil which moves relative to the magnet and  
3   wherein voltage is induced on the at least one coil by electromagnetic induction.

1                   18.    The generator as claimed in claim 17, wherein the first  
2   resonator device has a mechanical resonance frequency in the range of 1 to 100 Hz.

1                   19.    The generator as claimed in claim 17, wherein at least one of  
2   the magnet and the at least one coil is mechanically coupled to the resonator devices  
3   so that the magnet and the at least one coil move relative to one another to generate  
4   voltage on the at least one coil.

1                   20.    The generator as claimed in claim 18, wherein the second  
2   resonator device has a mechanical resonance frequency in the range of 1 to 10 kHz.

1                   21.    The generator as claimed in claim 19, wherein the second  
2   resonator device includes an array of micromechanical resonators and wherein each  
3   of the resonators has a coil formed thereon.